

Abstract for: "Third Workshop on the Fabrication, Characterization, and Applications of 6.1 A III-V Semiconductors"

Title: **GaSb Crystal Growth and Wafer Polishing**

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ABSTRACT

JX Crystals fabricates diffused-junction GaSb photovoltaic cells. Our low-bandgap cells are used as booster cells in tandem GaAs/GaSb solar cells and for thermophotovoltaic cells for use with combustion heat sources. Our solar cells can be used to power space satellites and our TPV cells can be used in quiet soldier-portable battery chargers.

As a result of our interest in GaSb photovoltaic cells, JX Crystals has grown 2", 3", and 4" GaSb crystals in-house using converted silicon CZ pullers. We then slice these crystals up into wafers. During 2000, we used a total of 70 two-inch wafers, 260 three-inch wafers, and 10 four-inch wafers to fabricate a total of over 5000 GaSb PV cells. Our cell yield was over 90%. Our fabrication process uses a simple diffusion where active junctions are formed in 30 wafers at a time in 1 hour in a furnace costing \$100k.

For our in-house device fabrication, we do not need to polish our wafers. In fact, we simply etch away saw damage prior to diffusion. However, there is a significant interest in the research community in using GaSb wafers for the fabrication of more complex devices using grown epitaxial structures. For this reason and because we already have a significant in-house GaSb capability, JX Crystals has purchased lapping and polishing equipment and we are now beginning to supply 2" and 3" polished GaSb wafers for the epitaxy research community.